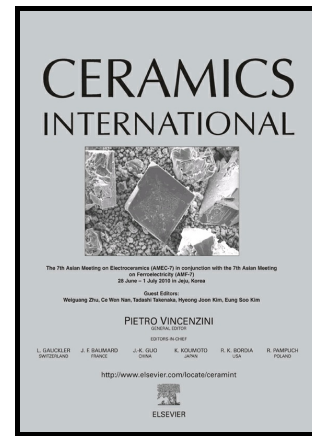


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# **Towards prediction of local corrosion on alumina refractories driven by Marangoni convection**

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**Abstract:** Refractory materials are used in the high-temperature melting of iron and steel, which are the basic materials in various metallurgical processes and other high-temperature industrial production and technology development methods. The Marangoni effect is a key factor in the direct premature destruction of refractory materials in use and exerts a significant impact on low-cost, high-quality steel production. In this study, the area of refractory/air/slag interface was expressed and observed. Based on the previous studies, the geometrical model of corrosion groove is modified by considering the erosion and dissolution of refractory oxides. The model is used to analyze the corrosion evolution caused by the Marangoni effect. The difference between the calculated results and the experimental results is compared, and the reliability of the geometrical and corrosion models is verified for predicting the Marangoni convection influence on the service life of refractory materials.

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